



Wisconsin Fast Plants™

Seed Stock Profile

F₁ and F₂ Generations of Non-Purple Stem

Single, recessive trait: *anl/anl*

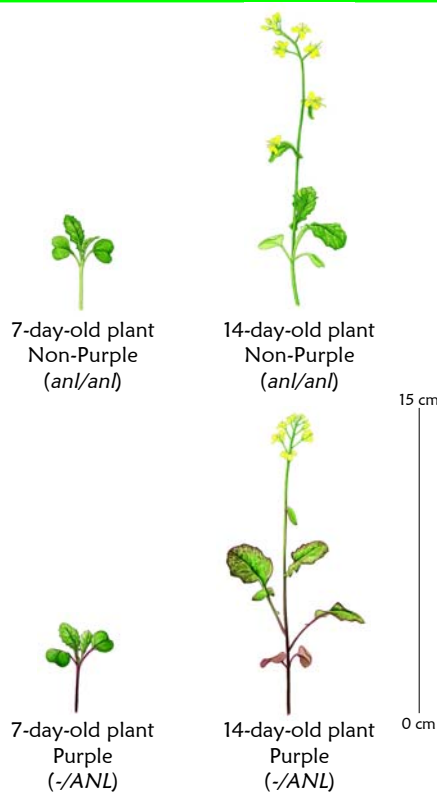
The F₁ (hybrid) generation is produced by crossing Non-Purple Stem plants (*anl/anl*) with Purple Stem plants that are homozygous for the wild-type allele (*ANL/ANL*). The resulting F₁ progeny have purple stems. The F₁ genotype is heterozygous (*anl/ANL*). This illustrates the principle of *dominance*.

The F₂ generation is produced by intermating the F₁ population and harvesting the seeds. The plants in this generation segregate in a 3:1 ratio of Purple:Non-Purple. (See back page for details.) This illustrates the *Law of Segregation*.

Purple Stem plants produce anthocyanin, a purple pigment found in Standard Wisconsin Fast Plants™. The purple color is visible on the stems and hypocotyls, under cotyledons, and at the leaf tips and hydathodes. Their genotype is either *ANL/ANL* or *anl/ANL* (which is abbreviated *-/ANL*).

Non-Purple Stem plants do not produce anthocyanin. The lack of anthocyanin causes the plants to appear a brilliant green color. Their genotype is *anl/anl*.

This stock is designed for teaching Mendelian genetics with a monohybrid cross. (See back page for details.)



Growing Tips

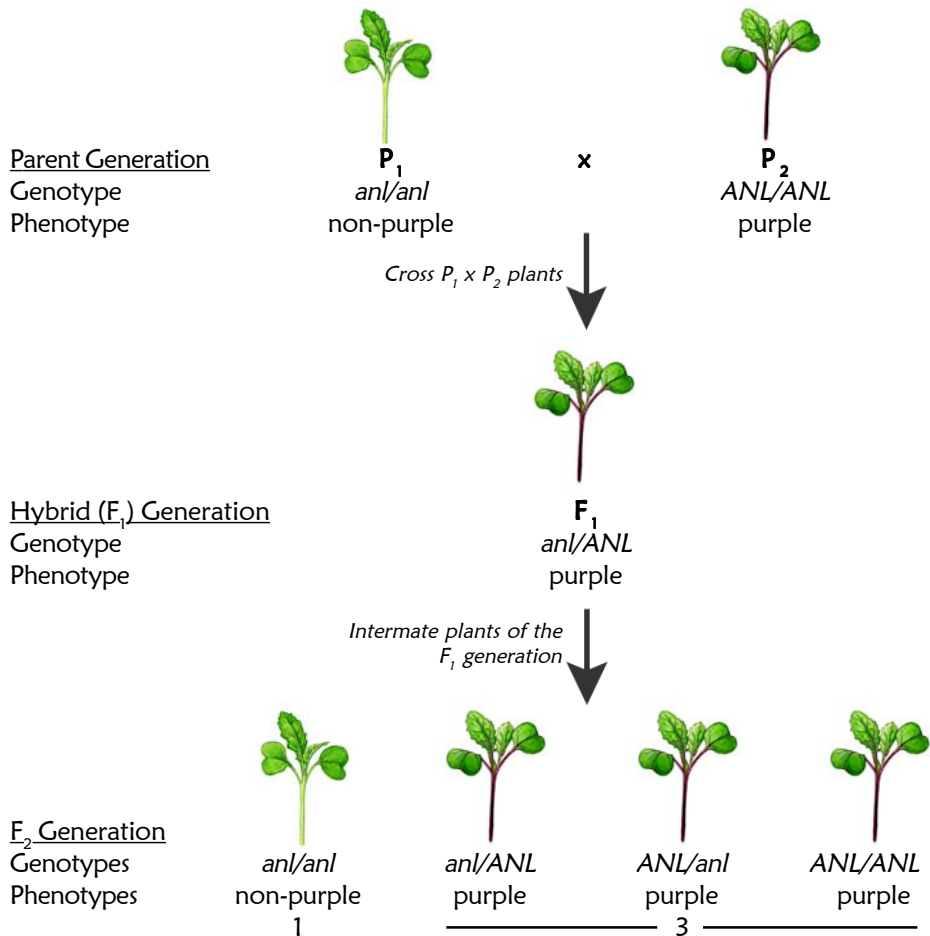
- 24-hour fluorescent light, water, and fertilizer are essential for Wisconsin Fast Plants™. Refer to *Growing Instructions* for more details.
- Prior experience growing Wisconsin Fast Plants™ is useful for comparing Non-Purple Stem and Purple Stem.
- The purple color is best observed on the hypocotyls (stems) when the plants are 4-7 days old.
- The amount of purple color is affected by the environment. A deeper purple color results from high light levels, low nutrient (fertilizer) levels, or petri-plate germination.

Length of life cycle: 35-45 days

Days to flowering: 14

Average plant height at day 14: 15 cm

Mendelian Genetics with a Monohybrid Cross Using Wisconsin Fast Plants™



Written by Wisconsin Fast Plants Program 2001. Layout by Sarah Lauffer. Color art by Allison Schroeer. Line art by Amy Kelley.

Tips for a Monohybrid Cross with the Anthocyaninless (*anl*) Gene

To ensure high seed yields, follow the *Growing Instructions* carefully. Expect an approximate 3:1 ratio of plants in the F₂ generation. Due to the random nature of gamete segregation, an exact 3:1 ratio is unlikely to be observed. Use the ratio as a foundation for understanding the Law of Segregation. Try graphing the data to see patterns, or do a χ^2 test to estimate the probability of the results. See www.fastplants.org for details about how to do this monohybrid investigation, or for information about the companion dihybrid investigation.



Wisconsin Fast Plants™ Seed Stocks Available:

Standard • Purple Stem, Hairy • Non-Purple Stem, Hairless
Non-purple Stem, Yellow-Green Leaf • Yellow-Green Leaf • Petite
Rosette-Dwarf • Tall Plant • Variegated • F₁ and F₂ Genetic Stocks

To order Wisconsin Fast Plants™ materials and seeds:

Carolina Biological Supply Company, 2700 York Road, Burlington, NC 27215 1-800-334-5551

Ordering info: www.carolina.com/fastplants Activity ideas: www.fastplants.org